

WHAT IS CLAIMED IS:

1

1. An arc fault detector for detecting arc faults in three phase aircraft power systems, comprising:

5

three full wave rectifiers each having an output connected to a threshold detector;

a three input comparator connected to an output of each of the threshold detectors; and

a fault verification circuit connected to an output of the three input comparator.

10

2. The arc fault detector of claim 1, wherein the threshold detectors comprise a first comparator having a first input connected to an output of one of the full wave rectifiers, a second input connected to a signal indicative of a predetermined threshold and an output.

15

3. The arc fault detector of claim 2, wherein the threshold detectors further comprise an integrator configured to integrate the output of the first comparator.

20

4. The arc fault detector of claim 1, wherein the three input comparator is configured to generate a signal indicative of the outputs of any two of the threshold detectors differing by more than a predetermined amount.

25

5. The arc fault detector of claim 1, wherein the fault verification circuit comprises:

an integrator connected to the output of the three input comparator; and

30

a comparator connected to the output of the integrator and configured to generate a signal indicative of the detection of a

1 fault, when the output of the integrator exceeds a predetermined threshold.

6. An arc fault detector for detecting arc faults in three phase aircraft power systems, comprising:

5 means for generating a signal indicative of each of the three phases;

means for rectifying the generated signals;

means for comparing the three rectified signals; and

10 means for generating a signal in response to the three rectified signals differing for a time period exceeding a predetermined duration.

7. The arc fault detector of claim 6, further comprising:

15 means for detecting that one of the three rectified signals exceeds a predetermined threshold; and

wherein the means for generating a signal in response to the three rectified signals differing for a time period exceeding a predetermined duration generates a signal if at least one of the three filtered signals exceeds the predetermined threshold.

20 8. A method of detecting arc faults in three phase aircraft power systems, comprising:

detecting at least one of the three phases having a current exceeding a predetermined threshold;

25 detecting differences between the three phases; and

generating a signal indicative of differences being detected between the three phases for a time period exceeding a predetermined duration.

30 9. The method of claim 8, wherein the detection of differences further comprises:

generating signals indicative of each of the three phases;  
1 and

generating a signal indicative of at least two of the three  
signals differing by more than a predetermined amount.

5 10. The method of claim 9, wherein detection of differences  
further comprises continuously monitoring the signals indicative  
of the three phases.

10 11. The method of claim 9, wherein the detection of  
differences further comprises continuously sampling the signals  
indicative of the three phases.

15 12. The method of claim 9, wherein generating a signal  
indicative of at least two of the three signals differing by more  
than a predetermined amount, further comprises integrating each  
of the signals indicative of each of the three phases over at  
least one cycle.

20 13. The method of claim 12, wherein generating signals  
indicative of each of the three phases further comprises:

comparing the magnitude of each phase to a predetermined  
threshold; and

generating a signal for each phase indicative of the  
magnitude of the signal relative to the threshold.

25 14. The method of claim 8, wherein generating a signal  
indicative of differences being detected between the three phases  
for a time period exceeding a predetermined duration further  
comprises:

30 generating a signal indicative of the time period during  
which at least two of the three phases differ by more than a  
predetermined amount; and

49188/DJB/L400

comparing the generated signal to a signal indicative of the  
predetermined duration.

1

5

10

15

20

25

30

35